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Doc Code: Artifact

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Artifact Type Code: U

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Microfilm(s)

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*Has received an application for a patent
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termined that a patent on the invention
shall be granted under the law.*

Therefore, this

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*Grants to the person or persons having
title to this patent the right to exclude
others from making, using or selling the
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United States Patent [19]
Powell et al.

[54] EXTENDING COMPUTER ARCHITECTURE
FROM 32-BITS TO 64-BITS BY USING THE
MOST SIGNIFICANT BIT OF THE STACK
POINTER REGISTER TO INDICATE WORD
SIZE

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[75] Inventors: Michael Powell, Palo Alto; Robert
Cmelik, Sunnyvale; Shing Kong,
Mountain View; David Ditzel, Los
Altos Hills; Edmund Kelly, San Jose,
all of Calif.

[73] Assignee: Sun Microsystems, Inc., Mountain
View, Calif.

[21] Appl. No.: 321,459

[22] Filed: Oct. 11, 1994

[63] Related U.S. Application Data
Continuation of Ser. No. 146,433, Oct. 29, 1993, which
is a continuation of Ser. No. 632,017, Dec. 21, 1990.

[51] Int. Cl.⁶ G06F 12/04
[52] U.S. Cl. 395/500; 395/800;
364/DIG. 1; 364/DIG. 2; 364/255.1;
364/254.9; 364/243; 364/948.1; 364/958.5;

[58] Field of Search 395/500, 800
364/970.3

[56]

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5,129,070 7/1992 Dorote 395/400

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If the application for this patent was filed on or after December 12, 1980, maintenance fees
are due three years and six months, seven years and six months, and eleven years and six
months after the date of this grant, or within a grace period of six months thereafter upon

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United States Patent [19]

Powell et al.

[11] Patent Number: 5,430,864

[45] Date of Patent: Jul. 4, 1995

- [54] EXTENDING COMPUTER ARCHITECTURE FROM 32-BITS TO 64-BITS BY USING THE MOST SIGNIFICANT BIT OF THE STACK POINTER REGISTER TO INDICATE WORD SIZE

[75] Inventors: Michael Powell, Palo Alto; Robert Cmelik, Sunnyvale; Shing Kong, Mountain View; David Ditzel, Los Altos Hills; Edmund Kelly, San Jose, all of Calif.

[73] Assignee: Sun Microsystems, Inc., Mountain View, Calif.

[21] Appl. No.: 321,459

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364/254.9; 364/243; 364/948.1; 364/958.5;
364/970.3

[58] Field of Search 395/500, 800

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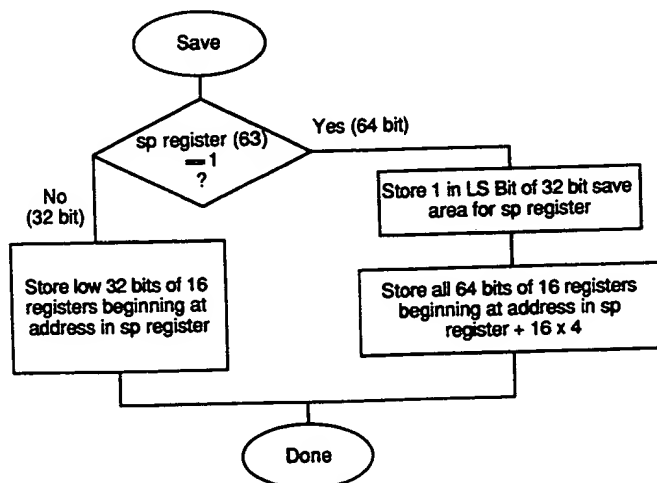
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[57]

ABSTRACT

The present invention enables a computer system to store from register files to memory, and restore from memory back to the register files, data from programs designed to operate in accordance with a first word size, as well as programs designed to operate in accordance with a second word size. This is accomplished without an increase in hardware and without requiring modification of existing software. In particular, an indication is utilized at the procedure level to designate whether a particular procedure is using words of a first or second word size. Preferably, this indication is placed in a first predetermined bit position in the stack pointer of the procedure. When a save occurs, certain contents from the register file are saved to memory along with the stack pointer. Under certain circumstances, the word size indication is moved to a second predetermined bit position within the stack pointer which is stored in a predesignated stack pointer address in the save area. When the contents are restored from memory, back to the register file, the indication is reviewed in the stack pointer address and serves to determine the word size of the procedure being restored.

16 Claims, 3 Drawing Sheets



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